

the tip; each segment of the abdomen below has on the sides a small obscure whitish spot.

Length 11 lines.

Hab. S. America? (H. G. Harrington, Esq.) (Coll. Brit. Mus.)

XXIX.—On *Sarcodictyon catenata* (Forbes).

By P. H. GOSSE, F.R.S.

[With a Plate.]

THE possession of a specimen of *Sarcodictyon catenata* in the highest health and vigour enables me to add a few particulars to what is known of its economy, and to give a figure of its appearance. I should premise that I have not by me the original account of the animal as published by the late Edward Forbes, but only the citation of it by Dr. Johnston in his 'British Zoophytes,' ed. 2. p. 179, and the figures in plate 33. figs. 4-7, which, he states, were copied from Forbes's drawings.

My specimen was obtained on the 8th instant, at Ilam, in this neighbourhood. Having chiselled off several pieces of the perpendicular sides of a sub-cavernous rock at extreme low-water, spring-tide, and plunged them, when brought home, into sea-water, my little son found, while examining them the next morning, several expanded polypes on one of the fragments, which seemed to him new, and to which he called my attention. On examination, I found that they belonged to this interesting species.

The creeping band is about half an inch in length and half a line in diameter, running in an irregularly sinuated direction. Within this space are five polypes, and there are three or four more scattered on the stone, close to the band, but whose connexion with it I cannot trace, nor with each other: they appear isolated. The colour of the band, which has a fibrous texture, is pellucid red; and that of the polypes, when contracted, is opaque pale red. Not one of Forbes's figures (in Johnston) bears more than the most remote and rude resemblance to what I see, with the exception of the right-hand polype in fig. 5 (*op. cit.*), which is a tolerable representation of the contracted condition; too conical, however.

The individual polypes, when in this state, bear a very close resemblance to a minute *Sagartia*: they are invested with a pellucid epidermis, which is thrown by contraction into annular folds. These folds are seen encircling the lower part of the column alone when the animal is fully extended (see Pl. IX. fig. *a*). Expansion takes place in the ordinary mode, the animal gradually taking a columnar form, and at length attaining a height

of rather more than one-fourth of an inch, with a thickness of about one-sixteenth (see fig. *b*).

The disk is surrounded by eight marginal tentacles, which often extend to one-fifth of an inch in length: their bases are thick and contiguous; their figure that of a cone much produced, and terminating in an exceedingly attenuate point. Each tentacle is fringed along each of its two lateral faces with a row of pinnæ, about fourteen in number in each row. These are conico-cylindrical processes, of extreme delicacy, longer in the middle of the row, and diminishing to each extremity.

The pinnæ are hollow throughout, with very thin parietes: their cavities communicate freely with that of the tentacle, of which they may be considered as cæcal appendages. They are composed, like the tentacles, of contractile tissue, doubtless muscular, and are capable of great elongation, or, at pleasure, of reduction to mere warts. The exterior surface of the pinnæ is studded with oblong tubercles, which are set on in a spiral of about five whorls, the extreme tip being invariably crowned by one of globose shape (see fig. *c*). Under the pressure of the compressorium, with a magnifying power of 600 diameters, these tubercles were seen to be composed of granular tissue, enclosing moderately few cnidæ, pointing outwards, and bearing on minute eminences of their surface the fine appendages which my friend Dr. T. Strethill Wright has named palpoils* (see fig. *d*). The cnidæ are ovate, arcuate, and very minute, averaging $\cdot 0004$ inch in length and $\cdot 0001$ inch in thickness. The tubercles have a decidedly spiral arrangement on the pinna, though the pinnæ are strictly bifarious on the tentacle.

Interiorly the pinnæ are richly ciliated; and corpuscles in the peritoneal fluid are seen forcibly driven to and fro by the conflicting currents. The epithelial lining of the tentacles is similarly clothed with cilia; but the currents here are chiefly manifest in the basal region, and their course is regularly downward into the interseptal cavities.

The disk presents nothing remarkable; it is smooth and translucent. The mouth is encircled by a thin lip, which is capable of protrusion in the form of a low circular wall. A good microscopic observation, obliquely down into the stomach, showed me that (on *that* side, at least; I can say nothing of the other) there is one gonidial groove, of which the edges were sometimes brought temporarily into mutual contact for a portion of their length, forming thus a tube, and at other times were widely separated—forming a broad and shallow channel. I could see no appearance of gonidial tubercles. The groove thus seen coincides with one of the extremities of the line which a transverse section

* Edinb. New Phil. Journ. for April 1857.

would present; for the form of the stomach here, as in *Alcyonium* and the *Actinioïds*, is that of a flattened sac, or that which a pillow-case would take, supposing it to be suspended longitudinally, and both ends to be unsewed. The inferior extremity of this long sac, which hangs down in the centre of the column, sustained in place by the eight septa, which connect it throughout its length with the column-wall, is entirely open, without the slightest constriction or appearance of a sphincter. It is in fact a little dilated, and runs off into eight produced points, coinciding with the septa, which pass off thence downward toward (and probably to) the bottom of the visceral cavity. The free edges of the septa, below the termination of the stomach, are thickened and much convoluted, each forming doubtless a craspedum; but the distinct sight of their structure is speedily lost in the swollen masses, of an opaque pale-red hue, into which they merge, and which nearly fill the cavity,—doubtless the ovaries.

It is remarkable that the most careful scrutiny failed to detect even a single spiculum in the texture. In *Alcyonium* these deposits are found by hundreds around the neck of the polype and running up into the tentacles, as well as in the skin of the column. But in my expanded *Sarcodictyons* none could be detected in the tissues of the living animal; and examination of the dead proved equally fruitless: for I separated one, pressed it to actual flatness between the plates of the compressorium, and allowed it to dry; then I treated it with a solution of caustic potash (Brandish's); finally I boiled the remains in the potash over a flame for some minutes; but with the most careful search, under a magnifying power of 600, and subsequently of 800 diameters, not a single spiculum appeared. I may observe, by the way, that after these processes the form of the pressed animal, and particularly of the tentacles with their pinnæ, remained perfect, whence I infer that the integument is of a chitinous nature.

On the other hand, the spicula were conspicuous enough in a dried specimen of *Sarcodictyon* similarly treated. Dr. Battersby had kindly given me a fine specimen of this species in the dry state, which he had dredged this summer on the coast of Galway. From this I cut off a small portion of the band including a single polype; and having macerated it in water and subjected it to boiling potash, I found the spicula conspicuous, though not very numerous. They were, in fact, distinctly identifiable with a power of 65 diameters, being on an average $\cdot 003$ inch in length, and some attaining to $\cdot 0055$. These spicula were of a transparent light-red hue, and of that pattern (though varying indefinitely in detail) which I have represented, in my

'Devonshire Coast,' pl. 3. figs. 3 and 4, as possessed by the spicula of *Alcyonium*, resembling "very gnarled branches of oak, with the branchlets broken off, leaving ragged ends." The figure given by Johnston, after Forbes—that of a four-rayed star, with minutely serrated margins—must surely have been a fancy portrait.

The whole of the expanded polype is transparent and colourless*, except the stomach, the craspeda of the septa, and the ovaries, which are opaque and light red. When the animal is contracted, these parts give their hue to the whole then visible, with the exception of the whitish, pellucid epidermis.

My specimens were (and *are*; for they still survive, after nearly three weeks' captivity) by no means "sluggish and shy." They expand very freely in pure water, and remain in full blossom almost the whole of their time. If touched rudely, they withdraw, but do not at all regard the movement of the vessel in which they are kept, nor the pushing hither and thither of the fragment of rock to which they are attached, nor a shock or jar given to the table, nor even a slight touch,—all of which would induce our more coy Anemones to veil their beauties from public gaze. And when they have retired, a very short time—perhaps a quarter of an hour, or less—sees them blossoming again as jauntily as ever. Their manners during expansion are sprightly, as almost every instant one or other of the tentacles, which move quite independently of each other, is bent inward toward the mouth, or jerked hither or thither, or suddenly shortened, or more slowly lengthened. These organs are usually carried arching outward and upward in sigmoid curves, like the branches of a candelabrum (see fig. *a*), imparting a most elegant appearance to this beautiful Zoophyte. The pinnae, too, are continually changing their position and figure by their independent contractions; ordinarily they bend downward and outward from the plane of the tentacle.

After one or two attempts I succeeded in feeding the polypes. The difficulty was in presenting the food in sufficiently minute morsels. I selected the flesh of the earthworm, having found that this is generally agreeable to zoophytic taste, and cut a piece of the integument into very minute atoms. One of these I then passed down on the point of a needle to the *Sarcodictyon*, watching it at the same time through a pocket lens. As soon as contact occurred, the tentacle grasped it, took it from the needle-point, and bending inward, passed it to the disk. Here one and another of the tentacles bent in towards it, all of them

* This is, however, due to distension; for when partially contracted, the septa, and even the skin of the column and tentacles, are seen to have a slight tinge of the same carneous hue.

by turns touching it, and as it were testing it. In the course of a few minutes the lips had closed upon the atom, and it was seen dilating the stomach as it slowly made its way downwards.

Sarcodictyon appears to me to approach very closely to the Helianthoid type. This genus on the one hand, and *Zoanthus* on the other, are probably the links by which the two suborders *Alcyoniaria* and *Actiniaria* are united. I have never had an opportunity of examining *Zoanthus*, but think it probable that isolated calcareous spicula will be found scattered in its tissues.

EXPLANATION OF PLATE IX.

Fig. a. *Sarcodictyon catenata*: a single polype expanded. Magnified 12 diameters.

Fig. b. The same, of the natural size.

Fig. c. A tentacular pinna. Magnified 85 diameters.

Fig. d. A pinna contracted and crushed flat between the plates of the compressorium. Magnified 250 diameters.

Sandhurst, Torquay, Sept. 27th, 1858.

XXX.—*Characters of some apparently undescribed Ceylon Insects.* By F. WALKER.

[Continued from p. 209.]

Fam. Buprestidæ.

CHRYSOBOTHRYS SUTURALIS. Cupreo-purpurascens, subtus cyaneo-
viridis aureo nitens, frontis lateribus thoracisque margine antico
auratis, elytris basi auratis, sutura cyaneo-*viridi*. Long. 4 lin.

AGRILUS SULCICOLLIS. Nigro-æneus, thorace transverse sulcato,
elytris punctatis foveolatis, lateribus antice emarginatis. Long.
1½ lin.

Fam. Elateridæ.

CARDIOPHORUS HUMERIFER. Niger, capite, thorace et elytris basi
rufis, elytris punctato-lineatis, luteo bifasciatis. Long. 3 lin.

CORYMBITES DIVIDENS. Rufa, capite, antennis, thoracis vitta pos-
tice abbreviata, elytrorum triente apicali abdominisque apice nigris.
Long. 3½ lin.

CORYMBITES DIVISA. Rufa, pubescens, capite, antennis, elytrorum
dimidio fere apicali abdomineque nigris. Long. 4½ lin.

ATHOUS PUNCTOSUS. Niger, dense pubescens, capite thoraceque
confertissime punctatis, antennis pedibusque piceis, elytris punctato-
lineatis. Long. 6 lin.

ATHOUS INAPERTUS. Niger, ferrugineo sordido dense tomentosus,
capite thoraceque subtilissime punctatis, elytris punctato-lineatis,
pedibus rufescentibus. Long. 4 lin.